

IN a paper read before the last meeting of the French Academy of Medicine M. Lagneau described his researches into the anæsthetics employed in Europe by physicians in the Middle Ages. That such were known is beyond any doubt. Abelard, speaking of the creation of Eve from a rib of Adam, speaks of the deep sleep which fell upon the latter as similar to that which physicians produce in patients upon whom they wish to operate. Pliny speaks of a stone of Memphis which, when crushed and treated with vinegar, renders any part to which it is applied insensible to pain; and many old authors speak of surgeons producing sleep in their patients before an operation by mixing with their food a decoction of the leaves or root of the mandragora, or some grains of the plant called "morion." Preparations of these two plants, as well as of other narcotics, were employed by surgeons down to the thirteenth and fourteenth centuries, but much less in subsequent times. Opium was also used for a similar purpose, while in the East the anæsthetic properties of hemp have been known from the earliest times. These were all taken into the stomach; but anæsthesia by inhalation was also known. Two different preparations were discovered in the thirteenth century: one by a Dominican of Rome, the other by a surgeon named Theodoric, who was also a preaching friar, and subsequently a bishop. Both of these were prepared from opium, henbane, mandragora, hemlock, and many other plants, and were inhaled from a sponge. It is, however, difficult to believe that preparations so little volatile could produce anæsthesia by simple inhalation. M. Perrin, who has studied ancient anæsthetics, has given the composition of a liquid which contains all the ingredients required for chloroform, and it is said that this was applied to witnesses or prisoners who were about to be tortured in the judicial tribunals of the Middle Ages. After inhaling it the unfortunate subject was plunged into a semi-comatose state, which diminished in a certain degree the pain of the torture. This liquid was always kept in a place adjoining the torture-chamber.

THE additions to the Zoological Society's Gardens during the past week include a Leadbeater's Cockatoo (*Cacatua leadbeateri*) from Australia, presented by Mr. H. Grant; two Great Eagle Owls (*Bubo maximus*), European, presented by Mr. E. G. Carpenter; a Common Peafowl (*Pavo cristatus*) from India, presented by Miss Rowland; an Indian Shama (*Copsychus macrurus*) from India, deposited; an Axis Deer (*Cervus axis*), two Squirrel-like Phalangiers (*Belideus sciureus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN

TUTTLE'S COMET.—In No. 2674 of the *Astronomische Nachrichten*, published during the last week, are elements and an ephemeris of this comet, by Herr Johannes Rahts of Königsberg. The orbit has been deduced from the observations of 1858 and 1871-2, with perturbations by Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and Uranus to July 11, 1885. Under such conditions it may be anticipated that Herr Rahts' ephemeris will closely represent the track of the comet. His elements are as follows:—

Perihelion passage, 1885, September 11 14265 G.M.T.

Longitude of perihelion...	116° 28' 53.8"	M. Eq. 1890.0
„ ascending node ...	269° 42' 1.5"	
Inclination ...	54° 19' 45.5"	
Angle of eccentricity ...	55° 14' 22.6"	
Mean daily motion ...	257".8648	
Log. semi-axis major ...	0.7590765	

Motion—direct.

Hence we have—

Eccentricity ...	0.8215436	Semi-axis major ...	5.7422
Perihelion distance ...	1.02475	„ minor ...	3.2739
Aphelion distance ...	10.4596	Semi-parameter ...	1.8666
Period of revolution, 13.76 years.			

Tuttle's comet was first seen by Méchain at Paris on January 9, 1790, and was observed there till February 1. Parabolic elements calculated by Méchain did not lead to any suspicion of ellipticity of orbit. On January 4, 1858, Mr. Tuttle, of Cambridge, U.S., discovered a comet, which was independently detected by the late Prof. Bruhns a week afterwards, and its orbit was found to present so close a resemblance to that of the second comet of 1790 as to immediately lead to the comets being considered identical, the identity being established by Bruhns, who found that five revolutions had been completed between 1790 and 1858. The dates of perihelion passage in this interval were thus determined by Clausen after taking into account the perturbations produced by the planet Jupiter—

	G.M.T.		G.M.T.
1790, January ...	30.87	1830, December ...	6.64
1803, November ...	7.27	1844, June ...	28.96
1817, May ...	18.76	1858, February ...	23.52

The comet was not recognised at any one of the four intermediate returns.

From Herr Rahts's ephemeris we have the following positions during the absence of moonlight in August:—

		At Greenwich Midnight		Log. Dist. from earth	Intensity of light
1885	R.A. h. m. s.	Decl. °			
August 6 ...	7 13 27 ...	+29 48.1	...	0.2853	0.39
7 ...	7 16 51 ...	29 12.7			
8 ...	7 20 14 ...	28 36.6	...	0.2816	
9 ...	7 23 36 ...	27 59.9			
10 ...	7 26 56 ...	27 22.7	...	0.2780	0.42
11 ...	7 30 16 ...	26 44.7			
12 ...	7 33 35 ...	26 6.3	...	0.2744	
13 ...	7 36 54 ...	25 27.3			
14 ...	7 40 12 ...	24 47.7	...	0.2708	0.46
15 ...	7 43 28 ...	24 7.4			
16 ...	7 46 43 ...	23 26.6	...	0.2674	
17 ...	7 49 59 ...	22 45.3			
18 ...	7 53 13 ...	22 3.5	...	0.2640	0.49
19 ...	7 56 27 ...	21 21.1			
20 ...	7 59 40 ...	20 38.0	...	0.2607	
21 ...	8 2 53 ...	19 54.5			
22 ...	8 6 5 ...	19 10.5	...	0.2575	0.52
23 ...	8 9 16 ...	18 25.9			
24 ...	8 12 27 ...	+17 40.8	...	0.2544	

The intensity of light when [the comet was first observed at Marseilles at its last appearance, October 12, 1871, is taken as unity. On September 10 it will be 0.55, the comet rising two hours before the sun. It must always be faint at its present return, so much so probably as to render observation difficult.

THE NEW COMET (BARNARD, July 7).—From observations on July 9, 12, and 15 the following elements result:—

Perihelion passage, 1885, September, 20.6740 G.M.T.

Longitude of perihelion ...	290° 10.5'
„ ascending node ...	93° 27.1'
Inclination ...	76° 6.1'
Log. perihelion distance ...	0.36549
Motion—direct	

An orbit calculated by Dr. Holetschek, of Vienna, much resembles the above.

It would appear that the perihelion distance of this comet may prove to be greater than in the case of any other comet hitherto computed, excepting the extraordinary one of 1729, which did not approach the sun within four times the earth's mean distance.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, AUGUST 2-8

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on August 2

Sun rises, 4h. 27m.; souths, 12h. 5m. 58.2s.; sets, 19h. 45m.; decl. on meridian, 17° 40' N.: Sidereal Time at Sunset, 16h. 31m.
Moon (at Last Quarter on August 3) rises, 21h. 56m.*; souths, 4h. 29m.; sets, 11h. 13m.; decl. on meridian, 5° 34' N.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian
Mercury ...	7 6 ...	13 50 ...	20 34 ...	7 56 N.
Venus ...	6 41 ...	13 42 ...	20 44 ...	11 14 N.
Mars ...	0 59 ...	9 19 ...	17 39 ...	23 50 N.
Jupiter ...	7 5 ...	13 57 ...	20 49 ...	9 21 N.
Saturn ...	1 20 ...	9 30 ...	17 40 ...	22 30 N.

* Indicates that the rising is that of the preceding day.

Occultation of Star by the Moon

August	Star	Mag.	Disap.	Reap.	Corresponding angles from ver- tex to right for inverted image
			h. m.	h. m.	
6 ...	B.A.C. 1526 ...	6 ...	3 32 ...	3 56 ...	129 174
August	h.				
4 ...	21 ...	Mercury in conjunction with and 2° 32' south of Jupiter.			
5 ...	17 ...	Saturn in conjunction with and 0° 4' south of μ Geminorum.			
6 ...	3 ...	Mercury at greatest elongation from the Sun, 27° East.			
6 ...	7 ...	Venus in conjunction with and 0° 26' north of Jupiter.			
6 ...	20 ...	Mars in conjunction with and 1° 20' north of Saturn.			
7 ...	8 ...	Mercury at greatest distance from the Sun.			
7 ...	14 ...	Saturn in conjunction with and 4° 13' north of the Moon.			
7 ...	15 ...	Mars in conjunction with and 5° 33' north of the Moon.			
8 ...	17 ...	Mercury in conjunction with and 3° 42' south of Venus.			

GEOGRAPHICAL NOTES

LIEUTENANT PALAT, of the French Cavalry, has been despatched by the Ministers of Public Instruction and of Commerce on a mission to the Sahara, his point of departure being Senegal and his terminus Algeria. The advanced posts recently occupied by the French in the Senegal, and the presence of a gun-boat on the Niger, are believed to render the present a favourable moment for such an expedition. At Timbuctoo Lieutenant Palat will appear as a French officer, but from this place to Algeria he will travel as a Moslem doctor. His mission, though of geographical interest, appears to be undertaken chiefly with the object of leading the trade of the Sahara to Senegal on one side and to Algeria on the other.

At the meeting of the Paris Geographical Society on the 3rd inst. M. Lostalot, French Consul at Jeddah, described in detail the circumstances attending the murder of M. Huber; a letter was read from M. Teisserenc de Bort continuing his account of his expedition in the Sahara; M. Jules Girard discussed the changes of level on the coasts of Scandinavia, and M. Demanche read a paper on the half-breeds of Canada, with especial reference to the recent revolt.

THE Spanish Government has appointed a geological commission, of which Señor Abella y Casariego is the president, to investigate the Philippines. The commission will not confine itself to geology, but will also study the geography and topography of the archipelago; and it is instructed to prepare a map which will complete and correct existing ones.

THE last *Bulletin* of the Royal Geographical Society of Antwerp (June IX. 6th fascicule) contains a report of the proceedings at the reception of Mr. Revoil on his return from the Somali country, and an interesting reprint of the diary of a journey from Antwerp to Vienna and back in 1724, made by representatives of a commercial corporation at Ostend to obtain certain alterations in the letters patent granted by the Emperor Charles VI.

A CORRESPONDENT writes:—In your note on Mr. Grenfell's recent explorations in the Congo Basin you state that the northern bend of the Congo is found by him to be in 2° 11' N. This had already been found by Stanley; *vide* the map in his recently-published book. You also note that the Mbangi River has been traced by him to a point in 4° 30' N. lat., lying north-by-east (magnetic?) of its mouth in 0° 26' to 0° 42' S. lat. At this ultimate point its breadth is stated to be 673 yards. Now the breadth of the River Thames at Gravesend is considerably

greater, and its source in a direct line from Gravesend westward is about 105 miles, the drainage area being, in round figures, 5000 square miles. Arguing from this we should conclude that the source of the Mbangi does not lie east of 20° E. long., and, applying the measurements to Stanley's map, the water parting falls just on the line thereon suggested. The distance in a direct line from the ultimate point reached by Mr. Grenfell to the last known point on the Welle is 540 miles, and to the source of the Welle some 900 miles. Judging, then, from this preliminary note, it appears to be practically impossible for this river, of less than the third of a mile in breadth, to carry off the water of the Welle Basin; and Mr. Stanley's suggestion that the Biyere (wrongly called the Aruwimi) is the outlet of the Welle is rather strengthened than otherwise by this latest, and certainly not least important, contribution to our knowledge of the mighty Congo.

A SOMEWHAT amusing quarrel has arisen between the parishes of Kjelvik and Maasö about a point of considerable geographical interest—viz. the proprietorship of the North Cape. It is caused by the establishment on the celebrated promontory of a *restaurant*, the taxes of which are claimed by both parishes. The Cape has always been considered to form the boundary between the two, without it being stipulated to whom it actually belonged.

THE Deutsche Seewarte has issued a chart of the ice in the Atlantic Ocean this spring, which, as it may be remembered, penetrated very far south and east in consequence of continuous northerly and north-westerly winds. Several icebergs appear even to have been found in the Gulf Stream. It seems from experience that, first towards the end of June the ice recedes northwards, while between the banks and the east coast of Newfoundland it remains longest, even after it has disappeared south and south-east of the banks.

FROM recent observations it would appear that during the last thirty years or so the elevation of the shores around the Baltic and the Gulf of Bothnia has gone on with greater rapidity than during the previous period of observation. The shore-marks by which the fact of the elevation has been ascertained were made about the year 1750, at the time of the dispute between Celsius, the celebrated Swedish astronomer, and a German man of science as to whether the level of the Baltic was rising or sinking, Celsius maintaining the latter view. Since the shore-marks were made it has been shown that a movement of elevation of the land has been going on around the island of Bornholm, the level of which remains constant. The rate of emergence is most rapid in the north. In the neighbourhood of the frontier of Finland it amounts to two metres, while in the south it is only a foot. The increased rate of emergence in recent times is clearly shown on the rock known as Stora Reppen, not far from Piteå. That rock in 1851 had emerged 94 cm. above its former level since the commencement of the observations, while in August, 1884, it had risen 50 cm. further.

THE Geographical Society of Australasia has, it is stated, completed arrangements for the exploration of New Guinea, and a fully-equipped expedition has started under the leadership of Capt. Everill.

THE HIGHER MATHEMATICS

PROF. G. MITTAG-LEFFLER, principal editor of the *Acta Mathematica*, forwards us the following communication, which will shortly appear in that journal:—

His Majesty Oscar II., wishing to give a fresh proof of his interest in the advancement of mathematical science, an interest already manifested by his graciously encouraging the publication of the journal *Acta Mathematica*, which is placed under his august protection, has resolved to award a prize, on January 21, 1889, the sixtieth anniversary of his birthday, to an important discovery in the field of higher mathematical analysis. This prize will consist of a gold medal of the eighteenth size bearing his Majesty's image and having a value of a thousand francs, together with a sum of two thousand five hundred crowns (1 crown = about 1 franc 40 centimes).

His Majesty has been pleased to entrust the task of carrying out his intentions to a commission of three members, Mr. Carl Weierstrass in Berlin, Mr. Charles Hermite in Paris, and the chief editor of this journal, Mr. Gösta Mittag-Leffler in Stock-